

Hold-Up, Stakeholders and Takeover Threats

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Abstract: We analyze the impact of takeover threats on long term relationships between the target owners and other stakeholders. In the absence of takeovers, stakeholders' bargaining power increases their incentive to invest but reduces the owners' incentive to invest. The threat of a takeover that would transfer value from the stakeholders reduces their ex ante investment. However, the stakeholders may appropriate ex post some value created by a takeover. This can prevent some value-enhancing takeovers. We examine extensions to the disciplinary role of takeovers, takeover defence mechanisms, and trade credit, and discuss empirical predictions. (*JEL: G34*)

Keywords: Takeovers, stakeholder, investment, hold-up, bargaining.

1 Introduction

Over the past decades, the costs and benefits of an active market for corporate control have been hotly debated. Most finance scholars argue that takeover activity is accompanied by operating and financial synergies, improved managerial discipline, more flexibility in internal capital markets, and a greater use of tax gains. Others argue that takeover threats lead managers to make myopic investment decisions, lead firms to suffer disadvantages from corporate diversification, and prevent firms from entering implicit contracts with workers.¹ This paper reexamines the merits of the market for corporate control in a framework that embeds explicitly strategic interactions among stakeholders.

We focus on the long-term interactions among an incumbent manager, a potential acquirer, and a long-term stakeholder.² We identify two conflicting effects: On the one hand, takeovers that are expected to hurt particular stakeholders will reduce their ex ante investment in the firm. On the other hand, where stakeholders stand to gain from a takeover (by appropriating a fraction of the value created), value-increasing takeovers may not take place. We discuss our results in light of existing empirical evidence, and we provide further empirical predictions about the effect of the possibility of a takeover on trading partners (including trade creditors) and workers. In particular, we suggest that stakeholder theories may be better tested on stakeholders other than workers because the relationship of the firm with these other stakeholders involve fewer outside contingencies

¹See among many others, Grinblatt and Titman (2001, ch. 20), Jensen (1988), Morck et al (1990), Scherer (1988), Shleifer and Summers (1988), and Stein (1988).

²At least three types of such stakeholders, apart from owners, can be affected by the possibility of a takeover: Debtholders, trading partners, and insiders, including managers and workers. A takeover can have many effects on these stakeholders, and the prospect of a takeover can alter the terms of the relationships among them. For instance, a takeover that leads to a change in capital structure will impact creditors. The prospect of a takeover threat will therefore affect the interest rate that creditors require. The takeover may also affect the company's market power and future supply contracts. The level of relationship-specific investment undertaken by the trading partners will also depend on the possibility of a takeover. The level of firm-specific investment made by workers, be it effort or temporary wage concessions, will also depend on the possibility of a takeover and the potential impact on future wage negotiations. To date, the existing literature on takeovers and stakeholders has focused on labor (Shleifer and Summers, 1988, Pontiff et al, 1990, and Rosett, 1990). By incorporating a more general set of stakeholders, we are able to provide a framework that integrates scattered theories of the real effects of takeover activity.

than its relationship with workers.

Our approach to a theory of takeover threats and stakeholder relationships draws on insights found in the literature on incomplete contracts and the hold-up problem.³ For simplicity, we first deliberately focus on a situation where a project depends primarily on a single stakeholder's investment, and where the only other investment is the costly takeover made by the bidder. We consider the special case where an entrepreneur runs a project whose future returns increase as the stakeholder exerts more effort. We suppose that this long-term relationship is governed by a sequence of short-term contracts. With long-term contracts ruled out, the expected negotiation of future short-term contracts affects ex ante investments. We start with the benchmark world of no takeovers. In this world, the entrepreneur may be better off ex ante with low ex post bargaining power: The stakeholder's bargaining power enhances his investment, as he expects to benefit more from this investment in future negotiations. In Section 5, we allow the entrepreneur to invest, and the stakeholder's investment is interpreted as financing the entrepreneur's investment. Then, as the stakeholder's bargaining power increases, the entrepreneur's financial constraint is relaxed, but his incentive to invest is lower.^{4,5}

³The hold-up problem arises when a party who privately incurs the cost of an investment, but only obtains a fraction of the return generated by this investment, is thus led to underinvest. The analysis of this problem has been a popular proxy for transaction costs in modern theories of the firm (see, among many others, Grossman and Hart (1986) and Tirole (1999)), as well as in the theoretical analysis of industrial relations (Grout (1984)).

⁴If the stakeholder's bargaining power is too high, then the entrepreneur is induced to underinvest. There is a tradeoff (from both the entrepreneur's and the social point of view) between the increased cost restricting the firm's incentive to invest and the benefits of a higher investment from the stakeholder. For example, we suggest that German unions' power induces them to agree on substantial real wage concessions in bad times (Layard et al (1991)) because they are confident they can secure benefits in future good times. This, however, comes at the cost of higher labor costs and a reduced incentive to invest from the firm's viewpoint, which has already been emphasized (Baldwin (1983), Bronars and Deere (1993a, 1993b) and Grout (1984)).

⁵More generally, the idea that a principal may benefit from giving power to an agent has recently received substantial attention. Aghion and Tirole (1997) show that to delegate authority may foster the agent's initiative. Dispersed ownership can commit shareholders to free ride and not to acquire information which may be used to overrule a manager (Burkart, Gromb and Panunzi (1997)), and not to renege upon the promises of deferred compensation to managers or workers (Habib (1997)). The manager and workers' efforts thus decrease as the ownership becomes more dispersed. Our analysis focuses on the effects of expected bargaining outcomes (rather than those of authority or free riding from shareholders) on several aspects of economic activity

These results are dramatically altered by the possibility of takeovers. In our setup, costly takeovers are made by acquirers with two characteristics: (1) They may, or may not, increase the firm's value, and (2) they may provide the acquirer with a higher fraction of the surplus created when bargaining with the stakeholder. When only the wealth transfer characteristics matter, implicit contracts are constrained by the possibility of takeovers which are aimed at accruing gains to the acquirer at the expense of the stakeholder. Once the investments are sunk, a tougher acquirer would earn more when bargaining than would the incumbent entrepreneur. This gives the acquirer an incentive to take over the firm. The takeover also affects the amount that the stakeholder expects to obtain from future negotiations, and hence his investment. Two possible cases can arise: Either the stakeholder prevents the takeover by restricting his investment to a level that leaves the rent to the acquirer below the takeover cost; or he accommodates the takeover and he restricts his investment to a level that is compatible with the tough acquirer running the firm. Furthermore, under the threat of a takeover, the stakeholder's investment may *decrease* with his bargaining power: When the stakeholder's bargaining power increases, the rent that the acquirer can obtain from taking over the firm increases as well for a given level of investment. When the stakeholder wants to prevent the takeover, he reduces his investment to leave the rent below the takeover cost. Hence, the limit on the investment that prevents the takeover becomes higher as the stakeholder's bargaining power decreases.

However, potential acquirers often create rather than transfer value. The market for corporate control allocates shares to those who value them most highly. Value creation by the acquirer has two effects: First, it alleviates this underinvestment problem to the extent that it increases the payoff to the stakeholder who obtains a (smaller) fraction of a larger pie. Second, this increase may be so high that it discourages the bidder from taking over the firm. The stakeholder appropriates a fraction of the value created by a value increasing takeover, while the acquirer bears the full takeover cost. This may actually reduce the likelihood of a value-increasing takeover, and thus backfire on the stakeholder

who then suffers from his inability to commit not to extract rents. In other words, there is a bilateral hold-up problem, where the value created by the stakeholder's investment and the bidder's acquisition is constrained by the fact that each party appropriates a fraction of the value created by the other.

The argument that the gains in hostile takeovers may derive from the breach of implicit contracts in the target firm has been discussed in Shleifer and Summers' (1988) seminal paper.⁶ However, the authors do not model ex-ante investment, and they focus on the wealth transfer hypothesis. In contrast, we analyze how value-creation alters wealth transfer and ex ante incentives, and we examine the impact of stakeholders' actions on takeover activity in a simple model which can be built upon. Although the literature on takeovers has evolved around the problem created by the free-riding behavior of small shareholders (Grossman and Hart, 1980), i.e. the hold-up problem that they create by appropriating the value created by a bidder and by discouraging him from taking over target firms, we emphasize that similar problems may originate from other stakeholders as well. This allows us to shed light on a number of issues and to derive further empirical predictions.

To date, the most popular proxies used to analyze the effect of takeovers on stakeholders have been wages, adjustments in the labor force and the behavior of unions during or before the takeover process. Most existing studies have documented that workers have incurred losses after takeovers. Among others, Rosett (1990) finds that a wealth transfer from workers to shareholders accounts for 10% of the hostile takeover premium within 18 years after the takeover, and 5% for friendly takeovers. Lichtenberg and Siegel (1989) find that after takeovers firms tend to cut the labor force in central offices.⁷ Pontiff et

⁶Their argument relies on the idea that the incumbent managers are committed to respect implicit contracts with workers, and that the bidder must sack the managers in a so-called hostile takeover to renege on the implicit contracts. We suggest that the analysis of a three-tier hierarchy could lead to the result that friendly takeovers may also lead to a breach of trust. This is consistent with empirical studies (Lichtenberg and Siegel (1989), Rosett (1990)).

⁷The business press is replete with examples of unions acting strategically with raiders. For example, in the US airline industry, the tough raider Lorenzo repeatedly failed to obtain wage concessions and good service from the workers of the airlines companies he took over. After Lorenzo's raids on TWA in 1985 and Eastern Airlines in 1986, the unions not only refused to make concessions, but also looked for a

al (1990) find that pension funds were reverted by 15.1% of acquirers in the two years following hostile takeovers, but only by 8.4% of acquirers within two years of friendly takeovers, and that reversions amounted on average to about 11% of the takeover premium. In addition, Warga and Welch (1993) and Asquith and Wizman (1993) document that in LBOs bondholder losses account for a statistically significant fraction of takeover premia. Asquith and Wizman also find that bondholders with strong covenant protection gain from LBOs. This can be interpreted as coinsurance, whereby LBOs make these secured bonds more secure or, equivalently, as bondholders' sharing of synergy gains. To date, little work has been done on either the impact of takeovers on trading partners, or the implicit contract hypothesis, i.e. the ex ante effect of an active market for corporate control on relationships with stakeholders.

Section 2 presents the model. Section 3 studies the effect of future negotiations on the stakeholder's effort. Section 4 analyzes the impact of takeovers and takeover defence mechanisms on effort and on how effort varies with bargaining power. Section 5 discusses how our analysis relates to the literature on the disciplinary role of takeovers, and it develops an extension to trade credit and its interactions with the market for corporate control. Section 5 also discusses a number of empirical predictions on the effect of takeovers on trade credit. Section 6 concludes. All proofs are contained in the Appendix in section 7.

white knight. They promised substantial wage concessions in exchange for the white knight overbidding Lorenzo. This succeeded for TWA where Icahn was offered 300 million dollars by the unions and, as a result, could overbid Lorenzo and finally bought the firm. The strategy failed for Eastern Airlines however, when Lorenzo demanded an unacceptable price. Later on, the Lorenzo empire collapsed (see Bernstein (1990)). Interestingly, although he was not as tough as Lorenzo, Icahn was far from being considered as a manager who accommodated unions. In this paper, we point out that for a given amount of wage concessions only a hard-nosed manager could act credibly as a white knight.

2 The Model

2.1 The Firm and the Stakeholder

An entrepreneur E wants to undertake a two-stage project. The project requires an action from a stakeholder in stage 1. The stakeholder's action is a non-contractible and firm-specific effort $e \geq 0$ at cost $c(e) = e$. In addition, denote w_t the stage $t \in \{1, 2\}$ price he obtains for his action. Let w_0 be the stakeholder's outside opportunity price in each stage.

Although the analysis holds for different types of shareholders, it is convenient to think of the effort as being provided by an input supplier. This reflects the stakeholder's willingness to work for a low w_1 before the firm generates its output in the hope of being compensated after the output is realized.⁸ For simplicity, we assume that the input market in stage 1 is perfectly competitive, and that the stakeholder has unlimited access to capital.

Under the incumbent entrepreneur, the project generates a return $R(e)$ in stage 2. We assume that R is twice differentiable with $R' > 0$, $R'' < 0$ and $R'(0) = +\infty$. For convenience, we set $f(e) = R(e) - w_0$ and assume that $f(0) = 0$. The project is profitable, i.e. $\exists e, R(e) \geq 2w_0 + e$. The entrepreneur's objective function is $\pi = R(e) - w_1 - w_2$ and the stakeholder's is $w_1 + w_2 - e$. For simplicity, we assume that the discount rate is zero.

Assumption 1 : *Long term contracts are not feasible.*

This assumption has been discussed at length in previous papers. For instance, it can be justified by arguing that the number of contingencies to be included in a long term contract would be either prohibitively costly or impossible to describe (Grossman and Hart, 1986, Tirole, 1999). An alternative explanation is that accounting manipulations are possible in order to hide profits, but that they can occur only before the effort is made (Bolton and Scharfstein, 1990).

⁸All our results concerning the price flexibility also hold if it is defined as $w_0 - w_1$.

Assumption 2 : *The stage 2 bargaining game proceeds as follows: a take-it-or-leave-it offer is made by the entrepreneur with probability p and by the stakeholder with probability $(1 - p)$. We call p the (publicly observable) entrepreneur's bargaining power.*

Several factors may affect bargaining power. For instance, when there are several stakeholders represented by a union, the union's bargaining power is likely to increase with the number of stakeholders; more representation brings more dues which can be spent on negotiating, looking for outside options, financing industrial actions, etc. It may also commit more stakeholders to the actions decided by the union. In addition, bargaining power can reflect characteristics of the production technology and/or the nature of the effort. For instance, the entrepreneur's bargaining power is likely to be low when the stakeholder hired in stage 1 is crucial for the realization of the return and when his effort is an investment which other firms value. The stakeholder's bargaining power in period 2 reflects the idea that the stakeholder is important in producing the output even after investing. The entrepreneur's bargaining power depends on her skills and the production technology.⁹ The bargaining power may also be affected by the concentration in ownership structure or the delegation of control: for instance, if the entrepreneur is the most important shareholder of the firm, she is more willing to spend time and effort in haggling when her share is large.¹⁰ Next, the different pricing or bargaining strategy subsequent to a takeover could be captured by modelling the idea that a takeover increases market power, whether it is a horizontal (Kim and Singal, 1993) or a vertical merger (Chemla, 2003).

⁹The entrepreneur's monitoring and/or production technologies may make him more or less dependent on the initial stakeholder. For instance, the entrepreneur may learn how to perform a number of productive and monitoring tasks. Since she will not be able to perform the tasks she did not learn, not to learn some tasks is a commitment to delegate. The stakeholder will observe what tasks the entrepreneur can perform, what tasks will be delegated to him and thus how necessary he is likely to be.

¹⁰In this case, we shall see that as in Habib (1997) and Burkart, Gromb and Panunzi (1997), the entrepreneur may wish to be a small shareholder because this commits him not to spend much on haggling. However, we shall keep the bargaining power exogenous.

2.2 The Acquirer

After the stage 1 effort is exerted, but before the return is made verifiable, a potential acquirer A decides whether or not to acquire the firm. A differs from the incumbent entrepreneur E in two respects.

- His bargaining power is $q > p$. An entrepreneur's type is common knowledge and can be viewed as a reputation that the entrepreneurs cannot manipulate.¹¹ For instance, this higher bargaining power may reflect the idea that takeovers are accompanied by a higher power on the product market, reducing the scope for attractive outside options for the stakeholder (Kim and Singal (1993), Chemla (2003)). It may also reflect higher concentration in ownership structure and a more rigorous management (see Habib (1997) and Jarrell et al (1988)).
- The stage 2 return under the potential acquirer is $\tilde{\alpha}R$, where $\tilde{\alpha}$ is an observable, but not verifiable, random variable which is realized at the end of stage 1. In other words, A 's valuation differs from E 's and is not known in advance. For convenience, $\tilde{\alpha}$ is uniformly distributed on $[\underline{\alpha}, \bar{\alpha}]$ with $0 < \underline{\alpha} \leq 1 + \frac{C}{R(e)} \leq \bar{\alpha}$.¹²

In addition to the cost of acquiring shares, the acquirer needs to bear a fixed cost C to take over the firm. We say that a takeover is (ex post) value increasing (resp. value decreasing) when the realization α of $\tilde{\alpha}$ satisfies (resp. violates) $\alpha R(e) - C > R(e)$, i.e. $\alpha > \alpha_V \equiv 1 + \frac{C}{R(e)}$. Note that this definition reflects the increase in value at the time of the takeover, but not the impact of the takeover on ex ante investment. Hence, it is not an appropriate proxy to analyze the welfare impact of takeovers in our model.

How the surplus is shared between the acquirer and the incumbent entrepreneur does not affect the analysis. However, the empirical evidence that the stock prices of acquired

¹¹For instance, their behavior depends on education and values taught to them earlier and which may be very costly to manipulate (Akerlof (1983)). Similarly, one might think that people acquire and use some skills and that new skills affecting their bargaining power are too costly or too long to acquire.

¹²This specification ensures that the acquirer benefits from the stakeholder's investment. Section 5 discusses the general case where the surplus generated under the acquirer is a function $S(e)$.

firms increase much more than those of acquiring firms suggests that the incumbent entrepreneur should have a large bargaining power.

2.3 The Timing

To sum up, the sequence of events is as follows:

- In stage 1, the stakeholder is hired via a contract which specifies a payment w_1 . He exerts an effort $e \geq 0$ at cost $c(e) = e$ and is paid w_1 . Then, $\tilde{\alpha}$ is realized and the potential acquirer A decides to whether or not take over the firm.
- In stage 2, the two parties bargain over a payment w_2 and sign a contract. Finally, a return $R(e)$ is generated and the stakeholder receives w_2 .

3 The Impact of Negotiation on the Stakeholder's Investment

In this section, we assume away takeovers, i.e. $C = +\infty$. The firm can only realize a return $R(e)$ under the incumbent entrepreneur. However, signing in stage 1 a contract contingent on the effort or on the second period profit is assumed to be either impossible or too costly. For a high level of effort to be chosen, the parties have to rely on self-enforcing contracts. For example, paying the stakeholder ex ante so that he makes an effort is not self-enforcing since he could take the money and leave the firm or shirk. What makes the agreement self-enforcing here is that the entrepreneur has to reward the stakeholder after the latter exerts his effort to realize a profit.

We proceed by backward induction and first derive w_2 . With probability p , the entrepreneur offers $w_2 = w_0$ to the stakeholder who does not benefit from his effort. With probability $1 - p$, the stakeholder offers $w_2 = R(e)$ and appropriates the whole surplus. Hence, in expected terms, $(E)w_2$ is given by

$$w_2 = w_0 + (1 - p)f(e). \tag{1}$$

In equilibrium, the stakeholder exerts

$$e^{**} = \arg \max_e \{w_0 + (1-p)f(e) - e\}. \quad (2)$$

which leads to

$$e^{**} = f'^{-1}\left(\frac{1}{1-p}\right). \quad (3)$$

This effort is lower than the first best level of effort e^* which maximizes $f(e) - e$, i.e. such that $f'(e^*) = 1$, that the entrepreneur could obtain via an incentive contract signed in stage 1 if complete long-term contracts were feasible. There is underprovision of effort with respect to the first best as soon as the entrepreneur's bargaining power is strictly positive.¹³ The stakeholder's individual rationality (IR) constraint can be written

$$w_1 + w_2(e^{**}) \geq 2w_0 + e^{**}. \quad (4)$$

Since the initial input market is perfectly competitive, this constraint is binding. Therefore, the initial payment is $w_1 = 2w_0 + e^{**} - w_2 \leq w_0 + e^{**}$ (with equality only for $e = 0$). The stakeholder expects to enjoy rents in stage 2 and is ready to work at a low payment in stage 1.

In addition, the competitive initial input market enables the entrepreneur to appropriate all the rents ex ante so that her payoff coincides with the total surplus. It is an increasing function of the effort up to the first best effort level and we obtain the following result:

Proposition 1 : *The stakeholder's effort and the entrepreneur's payoff all decline in p .*

Proof: See Appendix. □

¹³Allowing the stakeholder to buy the firm at the initial stage would solve this underinvestment problem. In our setting, the entrepreneur has a unique access to the technology that makes it possible to take the project. Hence, the stakeholder cannot buy the firm.

e^{**} and w_1 are constrained by the entrepreneur's inability to commit to a high w_2 . For instance, if the entrepreneur has all the bargaining power, she cannot commit in stage 1 to w_2 greater than w_0 . Thus, the stakeholder does not accept a payment w_1 lower than w_0 and has no incentive to exert effort. In contrast, the first best obtains when $p = 0$ because the stakeholder is the residual claimant. Low bargaining power enables the entrepreneur to commit to a high w_2 . A higher bargaining power increases the stakeholder's marginal revenue and hence his provision of effort.¹⁴

It should be noted that in our setting, the contractual solutions to the hold-up problem developed in earlier papers do not apply. In particular, MacLeod and Malcomson (1993) assume a rich enough verifiable partition of the set of the states of nature that is ruled out in our setting, while Chung (1991), Aghion, Dewatripont and Rey (1994) and Noldeke and Schmidt (1995) assume that a default trade option is contractible, which enables the parties to constrain renegotiation in order to elicit efficient investments. These assumptions are ruled out in our model.

4 Takeovers and Implicit Contracts

In this section, we introduce the possibility of takeovers. We thus assume $C < \infty$. We shall consider the variables to be functions of the entrepreneur's bargaining power: $e(p) = e^{**}(p)$, $f[p] = f(e(p))$, $w_1[p]$, $w_2[p]$.

To clarify the exposition, we first only allow takeovers that transfer value. We show that the acquirer's superior bargaining power reduces the stakeholder's investment, and that the stakeholder's investment does not necessarily increase with his initial bargaining power.

We then consider the possibility that takeovers create value. We show that value-decreasing takeovers that are motivated by wealth transfers may take place, and that

¹⁴Similarly, for a given p , the effort increases with the marginal return on effort $R'(\cdot)$. This suggests that the degree of competition in the product market should affect the impact of bargaining on the stakeholder's effort. For instance, if an increase in competition decreases the marginal return on effort, it also decreases the importance of stakeholder power.

there is a hold-up problem from the acquirer's perspective, as the stakeholder appropriates some of the value created by the takeover. We show that the stakeholder may benefit from takeovers, and that this benefit may be so high that it may discourage the bidder from taking over the firm. As a consequence, a stakeholder may suffer from his inability to commit to not appropriate some of the value created by the takeover during later negotiations.

4.1 The Impact of Wealth Transfers on Efficiency:

In this subsection, we first introduce the possibility of a takeover by an acquirer who would not affect the management of the firm except for bargaining with the stakeholder. In other words, the same return, $R(e)$, is realized under either E or A , but A has higher bargaining power with the stakeholder: $\underline{\alpha} = \bar{\alpha} = 1$.¹⁵ This takeover would be value-decreasing since the acquirer would have to incur a cost C without creating any surplus. We analyze the impact of the threat of such a takeover on the stakeholder's effort. We show that the threat of takeovers whose main motive is to reduce payments to the stakeholder prevents the entrepreneur from committing to some implicit contracts. Such a takeover threat can induce the stakeholder to underinvest and lower the total surplus and the entrepreneur's profit. Furthermore, we show that the stakeholder's effort may *decrease* with his initial bargaining power.

Proposition 2 : *When $C \leq (q - p)f[p]$, the threat of a takeover which would be purely wealth redistributive reduces both the stakeholder's effort and the total surplus. There exists $\underline{e} < e(q)$ such that:*

1. *If $(q - p)f(\underline{e}) \leq C < (q - p)f[p]$, then the stakeholder exerts the effort satisfying $(q - p)f(e) = C$ and there is no takeover. The stakeholder's effort and the total surplus **increase** with p .*

¹⁵If acquirers with a continuum of bargaining powers could take over the firm before the stakeholder is hired, the takeover would be led by the acquirer maximizing the value of the firm. This would be desirable if and only if the total surplus under the acquirer's bargaining power was higher than that under the incumbent entrepreneur.

2. If $C < (q - p)f(\underline{e})$, then the effort is $e(q)$ and the takeover takes place.

Proof: See Appendix. □

The effort is restricted by the mere threat of a takeover. The only incentive for A to take over the firm is to breach implicit contracts. When the effort is high, the return and the incentive to breach implicit contracts are high. Thus, the stakeholder may exert an effort that is low enough to prevent the takeover, i.e., choose \hat{e} such that $C = (q - p)f(\hat{e})$.

This implies that an increase in the incumbent entrepreneur's bargaining power reduces the incentive for an acquirer to take over the firm to gain from a lower w_2 . Thus, as the entrepreneur's bargaining power increases, the stakeholder can exert a higher effort while still preventing the takeover. Therefore, when the stakeholder restricts his effort in order to discourage a takeover, the stakeholder's effort *decreases* with his bargaining power.

The stakeholder is not always better off reducing his effort to prevent the takeover. When this strategic effort reduces the pie too much, he is better off enlarging the pie, i.e., exerting $e(q)$, and negotiating with A . However, he may be ready to reduce the pie below that under A to keep a larger share: we may observe a lower effort under the threat of a takeover by A than $e(q)$.

In sum, the stakeholder's effort is not monotonic in the entrepreneur's bargaining power: As p increases from 0 to 1, the effort (and, hence, the total surplus) first decreases in the range where there are takeovers, then increases in the range where there are takeover threats, and finally decreases again when the takeover cost is so high that there is no takeover threat. Effort is maximized for the smallest bargaining power such that the firm is not the subject of a takeover threat.

The discussion above implies that when the takeover is purely wealth redistributive and when its threat creates a hold-up problem with stakeholders, takeover defence mechanisms (TDM) may be desirable. TDMs can either increase the takeover cost (e.g. a poison pill or the obligation to declare a toehold even lower than what is required

by legislation) or confer the stakeholder the ability to prevent a takeover. This can be achieved either by voting or veto rights in the directory board (as in Germany for unions) or blockholdings such as either ESOPs or suppliers' blocks of shares in continental European countries and in a Japanese keiretsu.¹⁶ In this subsection, both types of TDMs are equivalent; they both prevent the takeover. Since the takeover is purely redistributive, both systems ensure that there is no breach of implicit contracts and that there is no takeover. Both of them lead to higher levels of effort, more surplus and a higher payoff for the incumbent entrepreneur when the initial input market is perfect.¹⁷

4.2 Wealth Transfer versus Value Creation

We now address the case where the entrepreneur and the acquirer also differ in their ability to run the firm. The acquirer's valuation in stage 1 is $\tilde{\alpha}R$, where $\tilde{\alpha}$ is an observable, but not verifiable, random variable, which is uniformly distributed on $[\underline{\alpha}, \bar{\alpha}]$ with $0 < \underline{\alpha} < 1 < \bar{\alpha}$, and which is realized at the end of stage 1.

The acquirer takes over when $q(\alpha R(e) - w_0) - C > p(R(e) - w_0)$, that is, when

$$\alpha > \frac{p}{q} + \frac{C + (q - p)w_0}{qR(e)} \equiv \alpha_A. \quad (5)$$

In particular, $\alpha_A \leq \alpha_V$ if and only if $q \geq \frac{pf(e)+C}{f(e)+C}$. In that case, the acquirer benefits from the wealth transfer but he only appropriates a fraction of the increase in value. When q is high, he benefits a lot from the wealth transfer, and the hold-up from the stakeholder is limited. Hence, q must be high enough for the acquirer to have an incentive to take over the firm that is excessive in terms of total payoff.

After a takeover, $w_2 = w_0 + (1 - q)(\alpha R(e) - w_0)$ instead of $w_0 + (1 - p)f(e)$. If $\alpha \geq \alpha_S \equiv \frac{1-p}{1-q} - \frac{qw_0}{(1-q)R(e)}$, w_2 is higher than under the incumbent entrepreneur and the

¹⁶Chaplinsky and Niehaus (1994), Dhillon and Ramirez (1994) and Gordon and Pound (1990) document that ESOPs decrease the likelihood of takeovers. Note that TDMs at the discretion of the entrepreneur would not help because the entrepreneur could not commit to prevent a takeover beneficial to him if he had discretion over the takeover cost.

¹⁷It should be noted that TDM and veto rights have option-like features. This implies that the way they alleviate the hold-up problem resembles that in, and can be seen as a real life equivalent of, Noldeke and Schmidt (1995). They differ mostly in that they are not an option to trade.

stakeholder profits from the takeover. Otherwise, w_2 is lower than it would be absent the takeover. As in the previous section, the stakeholder may either restrict his effort to prevent the takeover or accommodate the takeover. The acquirer only has a stronger incentive for taking over the firm than the stakeholder if q is high and p is low, because he can then benefit from a sufficiently high fraction of the value creation and potentially from some wealth transfer. In particular, if $q < \frac{pf(e)+C}{f(e)+C}$, $\alpha_S < \alpha_A$. Hence, there may be values of α for which the stakeholder would welcome the takeover, but the acquirer does not want to take over the firm. We thus obtain the following proposition:

Proposition 3 : *If $(1 - q)C < (q - p)f(e)$, then $\alpha_A < \alpha_V < \alpha_S$, i.e. value decreasing takeovers may take place in order to benefit from a wealth transfer, or the stakeholder may restrict his effort to prevent the takeover. If $(1 - q)C \geq (q - p)f(e)$, then $\alpha_S \leq \alpha_V \leq \alpha_A$, i.e. value increasing takeovers may not take place because the acquirer would bear all the cost of the takeover while he would appropriate only a fraction of the increase in value.*

If the wealth transfer is higher than the hold-up from the stakeholder, a takeover must increase value substantially to not reduce w_2 . If the hold-up from the stakeholder is more important than the transfer of wealth to the acquirer, only takeovers which create enough value will take place and there is no wealth transfer. The latter problem is actually all the more acute as q and $f(e)$ are small and p is large. This effect also makes all parties better off with an entrepreneur whose bargaining power is high enough.¹⁸

These two effects exactly offset each other when $p = \frac{q[C+f(e)]-C}{f(e)}$. With this value of p , the acquirer and the stakeholder would both prefer the first best level of takeover activity. In particular, the tougher the potential acquirer, the more acute the wealth transfer is likely to be, and the higher the bargaining power of the entrepreneur which

¹⁸Since the stakeholder cannot prevent a takeover which would transfer wealth, he cannot obtain a transfer from the acquirer before the takeover. On the other hand, an efficient negotiation between the stakeholder and the acquirer would actually solve the latter problem. The stakeholder may promise a payment to the acquirer to induce him to takeover the firm, but asymmetric information (Fudenberg and Tirole (1983)) and commitment problems may impede efficient bargaining. Other takeover facilitating mechanisms like the existence of active risk arbitrageurs and the ability to buy toeholds anonymously would also help.

maximizes the value of the firm. This value of p also maximizes ex ante investment and thus the value of the firm at the beginning of the game.

What effect do these results have on stakeholder's effort? The possibility of some ex post value increasing takeovers leading to a higher w_2 increases the effort ex ante and so the value of the firm. But the inability to commit to not transfer wealth from the stakeholder in some either value-increasing or value-decreasing takeovers leads the stakeholder to underinvest. At the time he exerts the effort, the stakeholder expects a payment of

$$\begin{aligned}
 w_2 &= w_0 + \frac{(1-p)}{\bar{\alpha} - \underline{\alpha}} \int_{\underline{\alpha}}^{\alpha_A} [(R(e) - w_0)] d\alpha + \frac{1-q}{\bar{\alpha} - \underline{\alpha}} \int_{\alpha_A}^{\bar{\alpha}} [\alpha R(e) - w_0] d\alpha \quad (6) \\
 &= w_0 + \frac{(1-p)(\alpha_A - \underline{\alpha})}{\bar{\alpha} - \underline{\alpha}} [(R(e) - w_0)] + \frac{(1-q)(\bar{\alpha} - \alpha_A)}{\bar{\alpha} - \underline{\alpha}} \left[\frac{\bar{\alpha} + \alpha_A}{2} R(e) - w_0 \right] \quad (7)
 \end{aligned}$$

An appropriate takeover defence mechanism would allow all value-increasing takeovers to occur at the end of stage 1 while preventing the firm from transferring wealth from stakeholders after a potential takeover to ensure an appropriate level of effort ex ante. A traditional anti-takeover mechanism (which increases the takeover cost) would not only prevent value-decreasing takeovers, but it would have to also prevent some value-increasing takeovers to ensure that there is no transfer wealth from the stakeholder.

We thus obtain the following proposition:

Proposition 4 : (1) A TDM increasing the takeover cost cannot allow all value increasing takeovers and ensure that there is no wealth transfer. (2) If $(1-q)C < (q-p)f(e)$, giving the stakeholder a veto right on the sale of the firm prevents wealth transfers, allows all desirable takeovers, and leads to a higher stakeholder's effort than any TDM increasing the takeover cost. (3) If $(1-q)C > (q-p)f(e)$, the firm does not benefit from an anti-takeover device.

Proof: See Appendix □

The intuition behind this result is simple. When C is low enough to allow all possible value increasing takeovers to occur, some of them can breach implicit contracts. On the

other hand, when C is high enough to protect the implicit contracts, a value increasing takeover may be prevented. A could buy the firm, pay C and breach implicit contracts for some realizations of $\tilde{\alpha}$ and could be prevented from buying the firm for others. C should depend on A 's valuation, but that is impossible since $\tilde{\alpha}$ is not contractible. Thus, a takeover cost C induces inefficiencies.

In contrast, the veto right enables the stakeholder to react ex post and its exercise will depend on the acquirer's valuation and the effect of the takeover on the stakeholder's payoff.¹⁹ With a veto right, there is no breach of implicit contracts and the takeovers which take place are exactly the desirable ones. It should be noted, however, that such veto rights may come with costs if bargaining between the acquirer and the stakeholder is inefficient, or if the stakeholder obtains some rents that have a real effect on the firm's activity. This may explain why stakeholders are not always granted veto rights.

5 Applications and Extensions

We now discuss two applications and extensions: We examine how a disciplinary role of takeovers can be embedded into our model, and we extend our analysis to trade credit. We examine a number of empirical predictions on vertical relationships and trade credit.

5.1 The Surplus Created by the Acquirer and Disciplinary Takeovers

In our setup, the value transfer in takeovers had a negative impact on the stakeholder's investment while value creation provided better incentives. In this section, we discuss how our model could be extended to include the argument that the threat of takeovers discipline stakeholders.

The reasoning behind the disciplinary takeover argument is that poor performance will prompt bidders to take over the firm, which will lead to a loss for the stakeholder

¹⁹In practice, veto rights can take a variety of forms, ranging from the power that minority shareholders can have in presence of supermajority rules to golden shares such as those that governments sometimes keep following privatization.

that did not perform well. Since the stakeholder anticipates this, the threat of a takeover provides him with incentives to create value.

This argument relies on the assumption that poor performance associated with low stakeholder's investment increases the probability of a takeover which is costly to the stakeholder. So far, this effect of takeovers did not arise in this paper because low investment also reduced the value under the acquirer, and so even more than the value under the entrepreneur when the takeover created value.

To see how this result is affected by a more general surplus function under the acquirer, assume that the surplus created under the acquirer is $\tilde{S}(e)$ rather than $\alpha R(e)$. The takeover creates value if the realization satisfies $S(e) - C > R(e)$. It takes place if $qS(e) - C > pR(e) + (q - p)w_0$, and the stakeholder benefits if $(1 - q)S(e) > (1 - p)R(e) - (q - p)w_0$.

The change in stakeholder wealth following a takeover can either increase or decrease with the investment. Intuitively, the change in stakeholder wealth is more likely to be increasing in e when the acquirer plans to build upon the firm's existing strength and expertise, while it may decrease in e when the acquirer plans to change significantly the corporate strategy.

In the latter case, the acquirer would only takeover the firm if effort is so low that a lot of value could be created following the acquisition. If the stakeholder expects to lose from the takeover, we are back to a setting that is similar to papers on disciplinary takeovers (e.g. Grossman and Hart, 1980), whereby the threat of a takeover provides the stakeholder with incentives to create value. However, when the surplus under the acquirer increases with stakeholder investment more than the surplus under the entrepreneur, investing more facilitates the takeover, and the loss to the stakeholder in case of a takeover induces him to invest less rather than more, i.e. takeovers are not disciplinary.

5.2 Financial Constraints and Trade Credit

We now consider the particular case of trade credit. We are not aware of any previous work on trade credit as an implicit contract, nor on the interactions between takeover threats and trade credit. However, trade credit is essentially a sequence of short-term credit contracts that the supplier extends to his client in potentially long term relationships. Such long-term relationships imply that the supplier may be willing to trade at favorable terms to the firm when this can improve the surplus created in the long run. In particular, when the firm faces financial constraints that could prevent it from taking a profitable project, the supplier may be willing to extend trade credit at attractive terms in the hope of benefiting from part of the value created by the project later on. While a traditional creditor typically relies on explicit long-term contracts in such scenarios, and may not be willing to finance a long term project when long-term contracts are not efficient, the supplier may rely on its importance in creating value by supplying essential input to extract rents at a later stage. This makes a supplier willing to extend trade credit in cases where traditional creditors would refuse to do so. Therefore, trade credit may involve an implicit contract component that can be affected by major corporate decisions such as takeovers.

5.2.1 Bargaining and the Supplier as a Source of Financing

In this section, we modify the model as follows. First, the project requires an initial investment K that requires financing from the stakeholder/supplier. Second, the return R is now assumed to be a function of the entrepreneur's investment, I . In other words, the initial capital K available to the entrepreneur is assumed to include the funds that can be raised from traditional creditors. We argue that when the supplier's bargaining power increases, a higher supplier's investment may come at the expense of the entrepreneur's incentive to invest, and we examine the relationship between trade credit and the possibility of takeovers.²⁰

²⁰All proofs in this section are omitted because they are very similar to those in the previous sections.

We first examine how this variation on the first model affects the analysis without takeovers. After signing the initial contract with the supplier, the entrepreneur's incentive to invest increases with p . However, her actual investment must satisfy the budget constraint $I \leq K - w_1 = K - w_0 + (1 - p)f(I)$ which becomes tighter when p increases. The difference $w_1 - w_0$ can then be interpreted as trade credit. When she cannot commit to invest at the beginning of the game, the entrepreneur chooses I so as to maximize $pf(I) - I$ under the constraint $I \leq K - w_0 + (1 - p)f(I)$, which implies $I = \min\{f'^{-1}(1/p), K - w_0 + (1 - p)f(I)\}$. Hence, there are costs and benefits for the entrepreneur and the suppliers of having a high bargaining power:

Corollary 1 : *The higher the supplier's bargaining power, the higher the amount of trade credit that he is willing to extend, and the lower the initial capital K that the entrepreneur needs to take the project, but the lower her incentive to invest when choosing I .*

The flexibility offered by having a powerful supplier has many other advantages, including avoiding bankruptcy. This can be obtained in a setting in which the supplier can obtain a rent from $w_1 + w_2$, and a shortfall at the end of stage 1 can be financed by the supplier. Bankruptcy will occur unless the supplier's rent if he finances the shortfall, $w_2 - w_0 = (1 - p)f(I)$, is higher than the cost of financing the shortfall. This will be the case if the supplier's bargaining power is large enough.

5.2.2 Takeovers and Trade Credit

This section studies how the possibility of takeovers may affect our analysis. When the entrepreneur is not financially constrained, a takeover increases the entrepreneur's marginal reward of investment and it is desirable. When the entrepreneur is financially constrained, we obtain:

Corollary 2 : *A takeover increases the entrepreneur's incentive to invest. The threat of a takeover that would lead to a loss to the supplier restricts the amount of trade credit*

that he is willing to extend and it tightens the entrepreneur's budget constraint. When the stakeholder is expected to gain from the takeover, there is a hold-up problem from the acquirer's viewpoint, and value-increasing takeovers may not take place.

When I is financially constrained, the supplier's expectation to lose from the takeover reduces his willingness to invest in the relationship, and hence it tightens the entrepreneur's budget constraint. But if the supplier expects to benefit from the takeover, the expected takeover will increase his willingness to extend trade credit. Overall, the supplier is better off extending trade credit to finance an investment allowing the takeover when he expects to benefit from the takeover, but he will strategically refuse to extend trade credit to ensure that the actual investment will not entail a takeover if the takeover hurts him. In this latter case, the possibility of a takeover decreases actual investment.

5.2.3 Empirical Predictions

The wealth transfer hypothesis and the value creation hypothesis may well be easier to test in vertical relationships, and more particularly trade credit, than in industrial relations, where so many possible contingencies may be observed. Direct evidence on the effect of takeovers on vertical relationships is difficult to track down directly because most input prices in long-term relationships are generally difficult to obtain. However, it is possible to examine both the stock price reaction of (closely) vertically related firms and the terms of trade credit after the announcement of a takeover. Trade credit has been surprisingly overlooked in the literature on takeovers and stakeholders. However, short-term trade credit (which is often rolled over) is a significant feature of long-term relationships with trading partners. We believe that trade credit is part of the compensation of a supplier, which typically includes the price for the input plus any profit/loss that is generated by the trade credit that he extends to the firm. Prices for input are difficult to observe. In contrast, features of trade credit are either easily available, e.g. through accounts payable or accounts receivables in balance sheets, or may be made available at a cost, e.g. the interest rate charged and the grace period offered.

Although we are not aware of any work that includes both takeovers and trade credit, existing empirical evidence on trade credit may provide partial support to discuss the empirical relevance of our model. For instance, Petersen and Rajan (1997) find that financially constrained firms use more trade credit than others. More specifically, firms in financial distress appear to increase trade credit compared to other forms of debt (Rajan and Zingales, 1995, and Franks and Sussman, 2002). This indicates that suppliers keep financing financially-constrained firms even when financial intermediaries do not. One reason for this may be that suppliers expect to benefit from their future interactions with the firm in a way that financial intermediaries cannot. The reason for this may be that the supplier expects to benefit from future negotiations through further input supply. Our analysis further suggests that the terms of trade credit would improve after the firm emerges from financial distress.

Furthermore, viewing trade credit as an implicit contract suggests that firms are expected to use more trade credit as *i*) their market power and *ii*) the length and *iii*) the specificity of their trade relationships increase: Firms facing more intense and more frequent competition are more subject to the constraints associated with spot markets, which restricts their ability to benefit from informal long-term relationships. This in turn restricts the value of short-term trade credit as an implicit contract.

The only existing empirical study that we are aware of that overlaps with our view of the interactions between trade credit and takeovers is Rajan and Zingales' (1995) finding that firms use more trade credit in Japan and in Germany, where cross-shareholdings are observed more often, than in the US and the UK, where the market for corporate control is more active. This appears to be broadly consistent with our results. Beyond this international comparison that is prone to a variety of other possible hypotheses, our analysis suggests that suppliers who have blocks of shares in firms are more likely to extend trade credit, and at better terms than other suppliers.

We also predict that following a takeover targets may see a change in the level and the terms (e.g. the interest rates and the grace period) of trade credit. The direction of

such effects would help to distinguish the implicit contracts hypothesis from the value creation hypothesis. For instance, the implicit contracts theory suggests that takeover targets have trade credit at more unfavorable terms than other firms before the takeover and that these terms improve after the takeover. The value creation hypothesis suggests that takeover targets see the terms of trade credit improve after the takeover, but that these terms are not necessarily unfavorable before the takeover.

If one pattern emerges clearly, it can help to extend the analysis of the real effects of takeover activity to predictions on the attributes of the firms that are more likely to become takeover targets. Existing empirical work focuses on what happens to stakeholders of the firms that do become targets, but it is generally silent on what are the characteristics of likely targets. This is undoubtedly an exciting challenge for future research.

6 Concluding Remarks

This paper pointed out that the threat of a takeover leading to a reduction in the compensation to stakeholders reduces stakeholders' investment, which, in turn, tightens the firm's financing constraint. The most efficient takeover defence mechanisms would allow all value-increasing takeovers while prohibiting any potential wealth transfers ex ante. Blocks of shares or veto power, by giving a stakeholder the power to block a takeover, would provide the best possible takeover defence mechanisms. By prohibiting wealth transfers, they actually increase stakeholder's investment, financially constrained investment, profits and shareholder wealth. However, this comes at the cost of preventing value-increasing takeovers, and reinforces the hold-up problem created by the fact that stakeholders appropriate a fraction of the increase in value while the bidder bears the full costs of his takeover. Ex ante, takeover defence mechanisms increase the investment from the stakeholder and relaxes the firm's budget constraint, but they decrease the shareholder's incentive to invest.

In our model, an appropriate takeover defence mechanism should provide the stake-

holders with a guarantee that they will not be expropriated from the revenues of their effort and while maximizing the probability of value-creating takeovers. When potential acquirers have different valuations which are not verifiable, anti-takeover defences should be endogenous and therefore implicit. Takeover defence mechanisms can help to sustain implicit contracts. Written anti-takeover contracts (e.g. poison pills) that increase the takeover cost are too rigid to satisfy this condition: they cannot allow for all desirable takeovers and protect implicit contracts at the same time. Giving the stakeholder the right to reject the takeover (unions' rights in directory boards in Germany) increases flexibility, but this may protect inefficient implicit contracts by allowing the stakeholder to maintain too high his bargaining power. Having the stakeholder own shares in the firm (e.g. blocks of shares for trading partners, Employee Stock Ownership plans (hereafter ESOPs) in the US) is an intermediary solution which may enhance the stakeholder's benefit from a value-increasing takeover, but without guaranteeing him that he will win for all possible acquirers like in the veto case unless his block can effectively prevent all takeovers which would transfer wealth from the stakeholder.

We discussed empirical predictions on trade credit associated with our results. Our analysis leads to testable predictions on other types of stakeholders as well. For instance, we expect employee stock ownership plans (ESOPs) to increase wage flexibility and to be used more widely in firms which are subject more heavily to financial constraints. We also expect shareholder wealth to be affected positively (resp. negatively) by ESOPs in firms whose profits (resp. do not) depend considerably on non-contractible stakeholders' investment and whose stakeholders do not (resp. do) have excessive rents.²¹ Our analysis also suggests that (1) unionization reduces investment more in firms which are potential takeover targets (partial empirical evidence on this is provided by Bronars and Deere (1993)) and (2) the decline of unions in the American and British private

²¹This may help reconcile apparently conflicting empirical evidence on the effects of ESOPs on shareholders' wealth (Chaplinsky and Niehaus, 1994, Dhillon and Ramirez, 1994, and Gordon and Pound, 1990). While the first two papers respectively find no significant impact and a positive impact of ESOPs on shareholder wealth, the third one finds that ESOPs established in the presence of takeover activity reduced stock prices (by 4%).

sectors in the past decades may be positively correlated with the development of the market for corporate control in these countries. In particular, this latter prediction is entirely consistent with the empirical observation that rates of unionization decreased in the private sector but increased in the public sector in the US in the 1980s (Lazear's symposium (1988)). However, we are not aware of any specific academic work on this correlation. We predict that a cross-sectional time series analysis would exhibit a pattern where firms with important implicit contracts (a proxy could be stakeholders' age) saw their unions/stakeholders' bargaining power particularly reduced subsequent to a more precise takeover threat or a higher takeover activity.

Although our discussion focused on takeovers via a financial market, our results would hold with any party which might either take an action which transfers rents or be replaced by a tougher party at some cost. For instance, a firm may want to terminate an overfunded defined benefit pension plan (Petersen (1992)). Alternatively, a government which is a priori favorable to stakeholders may see the implicit contracts he can enter constrained by the possibility of future elections leading to a new conservative government which is more favorable to shareholders. The incumbent government will thus need to be tough enough with stakeholders in order to be reelected. The main points remain valid for other cases such as the effect of other financial manipulations, e.g. high leverage, on wage negotiations (Perotti and Spier (1993) and Sarig (1992))²² and vertical relationships.

²²In Perotti and Spier, financial manipulations, used to force the stakeholders to renegotiate their price, make risk-averse stakeholders bear some risk, which is inefficient. The stakeholders' veto right would be Pareto-improving since it would make the risk-neutral party bear the risk by preventing the strategic use of financial manipulations.

7 Appendix

Proof of Proposition 1 : We have to prove only that w_1 increases with p and that it is lower than w_0 .

$$\forall p' > p, \forall e \geq 0, (1 - p')f(e) - e < (1 - p)f(e) - e \quad (8)$$

This implies that

$$\forall p' > p, \forall e \geq 0, \max_e (1 - p')f(e) - e < \max_e (1 - p)f(e) - e, \quad (9)$$

i.e., $w_1[p'] > w_1[p]$. □

Proof of Proposition 2 : A takes over if and only if $qf(e) - C > pf(e)$, that is

$$C < (q - p)f(e). \quad (10)$$

The RHS of (10) increases with e . When C is so high that (10) is not satisfied for $e = e(p)$, A never bids and the stakeholder chooses $e = e(p)$ (which decreases with p). When $C \in \left[(q - p)f[q], (q - p)f[p] \right)$, (10) is satisfied for $e = e(p)$, but not for $e = e(q)$. The stakeholder can deter the takeover by exerting a level of effort $\hat{e} \in [e(q), e(p)]$ such that $C = (q - p)f(\hat{e})$.²³ Knowing this, he will choose an effort satisfying

$$\max \left\{ \max_{e \in [0, \hat{e}]} (1 - p)f(e) - e, \max_{e \in [\hat{e}, e(p)]} (1 - q)f(e) - e \right\}. \quad (11)$$

Given that

$$\begin{aligned} \max_{e \in [\hat{e}, e(p)]} (1 - q)f(e) - e &\leq \max_{e \in [0, e(p)]} (1 - q)f(e) - e \\ &= (1 - q)f[q] - e(q) \\ &< (1 - p)f[q] - e(q), \end{aligned} \quad (12)$$

²³That $\hat{e} \geq e(q)$ comes from the fact that (10) is not satisfied for $e = e(q)$.

the stakeholder anticipates that he always loses from the takeover and he exerts \hat{e} in order to prevent it. He expects $w_2 = w_0 + (1 - p)f(\hat{e})$ and obtains his stage 1 price of $w_1(\hat{e})$. When p varies and q and C are given, $\hat{e} = f^{-1}\left[\frac{C}{q-p}\right]$ increases with p until $\hat{e} = e(p)$, and then the effort decreases with p . The prices satisfy

$$w_2 = w_0 + C \frac{1-p}{q-p} \quad (13)$$

$$w_1 = w_0 + f^{-1}\left[\frac{C}{q-p}\right] - C \frac{1-p}{q-p} \quad (14)$$

$$\begin{aligned} w_1' &= \frac{C}{(q-p)^2} \left[\frac{1}{f' \circ f^{-1}[C/(q-p)]} - (1-q) \right] \\ &= \frac{C}{(q-p)^2} \left[\frac{1}{f'(\hat{e})} - \frac{1}{f'(q)} \right] < 0. \end{aligned} \quad (15)$$

w_1 decreases and w_2 increases with p . The entrepreneur's bargaining power, p_t , which maximizes the stakeholder's effort, satisfies $(q - p_t)f[p_t] = C$ ($p_t \in [q, p]$).

When C is so low that (10) is satisfied for $e = e(q)$, the stakeholder can either choose a low effort $\underline{e} < e(q)$ satisfying $C = (q-p)f(\underline{e})$ (the existence of \underline{e} is ensured by continuity) so as to prevent the takeover and bargain w_2 with E or choose $e(q)$ knowing that A will take over the firm. He will choose \underline{e} if and only if

$$(1-p)f(\underline{e}) - \underline{e} = (1-p)\frac{C}{q-p} - \underline{e} \geq (1-q)f[q] - e(q). \quad (16)$$

It is worthwhile to choose a low effort to prevent the takeover when C is slightly lower than $(q-p)f[q]$. When C or p are very low, however, the stakeholder chooses $e[q]$ (which does not vary with p), and A takes over the firm. In addition, it is clear that \underline{e} increases with p . \square

Proof of Proposition 4 : Since (3) is ensured by the second part of Proposition 3, we only have to prove (1) and (2).

(1) Call α_1 and $\alpha_2 > \alpha_1$ two possible realizations of $\tilde{\alpha}$ in (α_V, α_S) and note $D_i = (q-p)\alpha_i f(e)$ with $i \in \{1, 2\}$. If the firm sets $C > D_1$, then a value increasing takeover

is deterred when α_1 is realized. If $C < D_2$, then the hold-up problem arises when α_2 is realized. Since D_1 is lower than D_2 , no C can protect implicit contract and allow value-increasing takeovers.

(2) If the stakeholder has a veto right on the sale of the firm (and C is exogenous), he refuses any sale reducing his compensation ex post. If $\alpha(1 - q) \geq (1 - p)$, he benefits from a takeover and will accept it. Otherwise, he accepts the takeover if and only if he gets a complementary transfer, N , such that $N + \alpha(1 - q)f(e) \geq (1 - p)f(e)$. The takeover takes place if and only if $(\alpha q - p)f(e) - N \geq D$. \square

REFERENCES

- Aghion, P., M. Dewatripont and P. Rey (1994), “Renegotiation Design under Unverifiable Information”, *Econometrica*, 62, 257-282.
- Aghion, P. and J. Tirole (1997), “Formal and Real Authority in Organizations”, *Journal of Political Economy*, 105, 1-29.
- Agrawal, A. and J. Jaffe (2003), “Do Takeover Targets Underperform? Evidence from Operating and Stock Returns”, *Journal of Financial and Quantitative Analysis* (forthcoming).
- Akerlof G. (1983), “Loyalty Filters”, *American Economic Review*, 73, 54-63.
- Allen, F. and D. Gale (1998), *Comparative Financial Systems*, mimeo Wharton School, University of Pennsylvania.
- Andrade, G. and E. Stafford (1999), “Investigating the Economic Role of Mergers”, mimeo Harvard Business School.
- Asquith, P. and T. Wizman (1990), “Event Risk, Covenants, and Bondholder Returns in Leveraged Buyouts”, *Journal of Financial Economics*, 27(1), 195-213.
- Baldwin C. (1983), “Productivity and Labor Unions: An Application of the Theory of Self- Enforcing Contracts”, **Journal of Business**, 56, 155-85.
- Bernstein A. (1990), *Grounded: Frank Lorenzo and the Destruction of Eastern Airlines*, Simon and Schuster (ed.).
- Bolton, P. and D. Scharfstein (1990), “A Theory of Predation Based on Agency Problems in Financial Contracting”, *American Economic Review*, 80, 93-106.
- Bronars, S. and D. Deere (1991), “The Threat of Unionization, the Use of Debt, and the Preservation of Shareholder Wealth”, *Quarterly Journal of Economics*, 106, 231-254.

- Bronars, S. and D. Deere (1993a), "Union Organizing Activity, Firm Growth, and the Business Cycle", *American Economic Review*, 83, 203-20.
- Bronars, S. and D. Deere (1993b). "Unionization, Incomplete Contracting and Capital Investment", *Journal of Business*, 117-31.
- Bull C. (1987), "The Existence of Self-Enforcing Implicit Contracts", *Quarterly Journal of Economics*, 147-159.
- Burkart, M., D. Gromb and F. Panunzi (1997), "Large Shareholders, Monitoring and the Value of the Firm", *Quarterly Journal of Economics*.
- Chaplinsky, S. and G. Niehaus (1994), "The Role of ESOPs in Takeover Contests", *Journal of Finance*, 49(4), 1451-70.
- Chemla G. (2003), "Downstream Competition, Foreclosure, and Vertical Integration", *Journal of Economics and Management Strategy*, 12(2), 261-89.
- Chung, T.-Y. (1991), "Incomplete Contracts, Specific Investments, and Risk Sharing", *Review of Economic Studies*, 58(5): 1031-42.
- Comment, R. and W. Schwert (1995), "Poison or Placebo? Evidence on the Deterrence and Wealth Effects of Modern Antitakeover Measures", *Journal of Financial Economics*, 39(1), 3-43.
- Chung T.-Y. (1991), "Incomplete Contracts, Specific Investments, and Risk Sharing", *Review of Economic Studies*, 58(5), 1031-42.
- Dhillon, U. and G. Ramirez (1994), "Employee Stock Ownership and Corporate Control: An Empirical Study", *Journal of Banking and Finance*, 18(1), 9-26.
- Frank, M. and V. Maksimovic (1999), "Trade Credit and Adverse Selection", mimeo University of Maryland.
- Franks, J., and O. Sussman (2002), "Resolving Financial Distress By Way of a Contract:

- an Empirical Study of Small UK Companies”, mimeo London Business School.
- Garvey, G. and N. Gaston (1997), “A Theory of the Optimal Cost Barrier to Corporate Takeovers”, *International Economic Review*, 38, 3, 657-75.
- Garvey, G., and G. Hanka (1999), “Capital Structure and Corporate Control: The Effect of Antitakeover Statutes on Firm Leverage”, *Journal of Finance*, 54(2), 519-46.
- Giammarino, R., R. Heinkel and B. Hollifield (1997), “Defensive Mechanisms and Managerial Discretion”, *Journal of Finance*, 52(4), 1467-93.
- Gordon, L. and J. Pound (1990), “ESOPs and Corporate Control”, *Journal of Financial Economics*, 27(2), 525-55.
- Grinblatt, M. and S. Titman (1998), *Financial Markets and Corporate Strategy*, Irwin-McGraw Hill, ch. 19.
- Grossman, S. and O. Hart (1980), “Takeovers Bids, the Free-Rider Problem, and the Theory of the Corporation”, *Bell Journal of Economics*, 11, 42-64.
- Grossman, S. and O. Hart (1986), “The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration”, *Journal of Political Economy*, 94, 691-719.
- Grout P. (1984), “Investment and Wages in the Absence of Binding Contracts: A Nash Bargaining Approach”, *Econometrica*, 52, 449-60.
- Habib M. (1997), “Why are Leveraged Buyouts Not Permanent?”, *European Finance Review*, 139-63.
- Hart, O. and B. Holmström (1987), “The Theory of Contracts”, in *Advances in Economic Theory, Fifth World Congress of the Econometric Society*, T. Bewley (ed.), Cambridge University Press.
- Holmström (1988), Comment on “Breach of Trust in Hostile Takeovers”, in *Corporate Takeovers: Causes and Consequences*, Edited by Alan J. Auerbach, University of

Chicago press.

- Jarrell, G., J. Brickley and J. Netter (1988), "The Market for Corporate Control: The Empirical Evidence Since 1980", *Journal of Economic Perspectives*, Vol. 2, No. 1, 49-68.
- Kim, E.-H. and V. Singal (1993), "Mergers and Market Power: Evidence from the Airline Industry", *American Economic Review*, 83(3), June, 549-69.
- Lazear E. (1988), "Symposium on Public and Private Unionization", *Journal of Economic Perspectives*, 2, 59-110.
- Lichtenberg, F. and D. Siegel (1989), "The Effect of Takeovers on the Employment and Wages of Central-Office and Other Personnel", *NBER working paper No. 2895*.
- MacLeod, B. and J. Malcomson (1993), "Investment, Hold-Up and the Form of Market Contracts", *American Economic Review*, 83, 811-837.
- Malatesta, P. and R. Walkling (1988), "Poison Pill Securities: Stockholder Wealth, Profitability, and Ownership Structure," *Journal of Financial Economics*, 347-76.
- Morck, R., A. Shleifer and R. Vishny (1990), "Do Managerial Objectives Drive Bad Acquisitions?", *Journal of Finance*, 45, 31-48.
- Neumark D. and S. Sharpe (1996), "Rents and Quasi Rents in the Wage Structure: Evidence from Hostile Takeovers", *Industrial Relations*, 35(2), 145-79.
- Noldeke, G., and K. Schmidt (1995), "Option Contracts and Renegotiation: A Solution to the Hold-Up Problem", *Rand Journal of Economics*, 26(2), 163-79.
- Perotti, E. C. and K. E. Spier (1993), "Capital Structure as a Bargaining Tool: The Role of Leverage in Contract Renegotiation", *American Economic Review*, 83, 1131-41.
- Petersen M. (1992), "Pension Reversions and Stakeholder-Stockholder Wealth Transfers", *Quarterly Journal of Economics*, 1033-53.

- Petersen, M. and R. Rajan (1997), "Trade Credit: Theories and Evidence", *Review of Financial Studies*, 10(3), 661-91.
- Pontiff, J., A. Shleifer, and M. Weisbach (1990), "Reversions of Excess Pension Assets After Takeovers", *Rand Journal of Economics*, 21, 600-13
- Rajan, R. and L. Zingales (1995), "What Do We Know about Capital Structure? Some Evidence from International Data", *Journal of Finance*, 1421-60.
- Rosett J. (1990), "Do union wealth concessions explain takeover premiums", *Journal of Financial Economics*, 27, 263-82.
- Sarig O. (1992), "The Effect of Leverage on Bargaining with a Corporation", mimeo Tel Aviv University.
- Scherer F. (1988), "Corporate Takeovers: The Efficiency Arguments", *Journal of Economic Perspectives*, Vol. 2, No. 1, 69-82.
- Shleifer, A. and L. Summers (1988), "Breach of Trust in Hostile Takeovers", in *Corporate Takeovers: Causes and Consequences*, Edited by Alan J. Auerbach, University of Chicago press.
- Stein J. (1988), "Takeover Threats and Managerial Myopia", *Journal of Political Economy*, 96 (1), 61-80.
- Tirole J. (1999), "Incomplete Contracts: Where do we Stand?", *Econometrica*, 67, 741-81.
- Warga, A. and I. Welch (1993), "Bondholder Losses in Leveraged Buyouts", *Review of Financial Studies*, 6(4), 959-82.